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United States General Accounting Office

Report to the Ranking Minority Member,
Committee on Governmental Affairs, U.S.
Senate

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WEAPON SYSTEMS

Changing Roles and Priorities for the Army's OH-58D Helicopter Program

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National Security and
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September 30, 1988

The Honorable William V. Roth, Jr.
Ranking Minority Member
Committee on Governmental Affairs
United States Senate

Dear Senator Roth:

this report
As requested by your office, we have examined the Army's current plans to meet its aerial scout mission needs. To meet these needs, the Army initiated the Army Helicopter Improvement Program (AHIP) to upgrade existing OH-58 helicopters to an OH-58D configuration. During the past 3 years, the primary role for the OH-58D has changed from being a scout and a target designator for AH-64 attack helicopter units to being assigned to air cavalry units as a scout for ground commanders. The Army Chief of Staff is currently considering additional roles for the modified helicopter.

When the Army recommended full-scale procurement of the OH-58D in 1985, it planned to modify 578 helicopters to serve in three scout roles: (1) with AH-64 Apache attack helicopter units as a target locator and designator, (2) with air cavalry units to perform aerial reconnaissance for ground commanders, and (3) with artillery units as a target locator and designator. Since then, the OH-58D's roles and quantities have changed several times, as table 1 shows.

Table 1: Changes in AHIP Since July 1985

Date	Decision by	Total planned procurement	Primary role (secondary role)	Reason for change
July 1985	Secretary of the Army	578	Attack helicopter units (Artillery units) (Air cavalry units)	
Oct. 1985	Secretary of Defense	179 ¹	Artillery units	More test data needed to adequately demonstrate other two roles
Aug. 1986	Army Chief of Staff	135	Artillery units	Budgetary constraints
May 1988	Army Chief of Staff	477	Air cavalry units (Artillery units)	1987 air cavalry testing and 1988 aviation modernization plan
July 1988	Secretary of Defense	375	Air cavalry units (Artillery units)	Defense funding plan covers fewer years than Army plan

¹The decision memorandum did not specify an authorized quantity. The Army's artillery role requirement at that time was 179 OH 58Ds

Several issues regarding the OH-58D are still to be decided, which may result in further changes to the program. The Army is currently considering arming most OH-58Ds with air-to-ground weapons to give them the capability to attack ground targets. Those armaments would enable the OH-58D to add armed reconnaissance and attack helicopter operations to its original three roles. If the Army decides to arm the OH-58D with air-to-ground weapons, other issues will have to be addressed, including whether the armed OH-58Ds will replace older attack helicopters, such as the AH-1 Cobra, and whether more testing will be required.

In addition to these issues, using OH-58Ds with AH-64s in attack helicopter units may resurface as an issue in the future. While current Army plans do not include OH-58Ds working with AH-64s in attack helicopter units, the Army teamed the two helicopters in recent field exercises and found the results favorable. A senior advisory group, established by the Under Secretary of Defense, has recommended that the issue of scout helicopters working with attack helicopter units be reviewed further, and the Department of Defense is planning a future test of OH-58Ds and AH-64s to address this issue.

Program Description

[illegible]

The AHIP is a major modification of existing OH-58A Kiowa helicopters into OH-58D helicopters, including a new rotor system, engine, power train, and new avionics components. The Army determined that the modifications were necessary to improve flight performance and to provide new capabilities. The OH-58D helicopters were to offer (1) improved hot-weather and nap-of-the-earth flight performance;¹ (2) a target acquisition and laser designation system for day and night operations; (3) improved communication and navigation; and (4) space, weight, and power to permit adding air-to-air Stinger missiles. The target acquisition and designation system was to be housed in the mast-mounted sight to enhance survivability by allowing surveillance, target acquisition, and target designation from extended ranges with minimal exposure.

The OH-58D was intended to replace observation helicopters in air cavalry, attack helicopter, and field artillery units. Air cavalry units use scout helicopters primarily to obtain information through rapid reconnoiter and surveillance over wide areas of the battlefield. Ground commanders can make force deployment decisions based on this

¹ Nap-of-the-earth refers to flying close to the earth's surface to avoid detection.

information. In attack helicopter units, the scout is to assist attack helicopters to destroy targets by coordinating the attack, designating and then handing over targets, gathering target information, and providing security. OH-58D scouts, with their lasers, can designate targets for Hellfire missiles fired from the attack helicopter. In artillery units, the scout conducts battlefield reconnaissance. It communicates with the ground units to request or adjust artillery fire. The OH-58D would employ its laser beam to guide precision guided munitions to targets.

In 1981, the Army awarded a contract to Bell Helicopter Textron to develop the OH-58D by modifying the OH-58A helicopter. In 1984, the Army awarded a contract to Bell for the initial procurement of 16 OH-58Ds. As of August 1988, the Army had contracted for a total of 135 OH-58Ds.

Army officials estimate the procurement cost of each OH-58D armed with air-to-ground weapons to be \$7.1 million (escalated dollars), based on a procurement of 375 units. They estimate that the air-to-ground arming comprises about \$1 million to \$1.1 million of the unit cost. The Army is still studying the cost estimate, and, according to program officials, the actual cost is highly dependent on the production rate as well as on the total quantity.

OH-58D Limited to Artillery Units Following 1985 Operational Testing

The Army completed an operational test of the OH-58D in February 1985 to support a full-scale production decision. Based on this test, the Army recommended full-scale production of 578 OH-58Ds for the three scout roles. The Army planned to employ most of these—429 helicopters—in AH-64 attack helicopter units.

The Director of Operational Test and Evaluation, Office of the Secretary of Defense, however, disagreed with the Army's assessment of the operational test results. The Director concluded that in the attack and air cavalry roles, the OH-58D demonstrated no significant advantage in combat effectiveness over the existing OH-58C helicopter (an upgraded version of the OH-58A model that had been included in the test as the baseline to measure performance against). The Director concluded that the OH-58D's failure to perform better in the test was because of personnel and training problems, not because of deficiencies in the helicopter.

In October 1985, after considering the operational test results, the Secretary of Defense approved continued procurement of the OH-58D for use in the artillery observer role, which amounted to 179 helicopters based

on Army requirements at the time. However, he withheld approval of procurement for the attack helicopter unit and air cavalry roles and directed the Army to perform additional tests to determine the operational effectiveness and suitability of the OH-58D in these roles. He also directed that such tests evaluate the proper quantity mixes of attack and scout helicopters when working as teams.

Although the Army planned a follow-on operational test to demonstrate the OH-58D's effectiveness in the air cavalry and attack helicopter unit roles, budget constraints caused the Army Chief of Staff to cancel future AHHP procurement, except for 135 OH-58Ds to be used in the artillery role. In light of this August 1986 decision, the Army abandoned plans for the follow-on operational test and instead planned a new test to determine which existing Army helicopters, including attack helicopter models, could serve as scout helicopters in lieu of the OH-58D. The test was referred to as the Army Aerial Scout Test.

OH-58D Approved for Air Cavalry Units Based on 1987 Aerial Scout Test

The Army conducted the Aerial Scout Test from March through May 1987 to assess five helicopters performing as scout candidates. They included the OH-58D, OH-58C, AH-64, AH-1, and an OH-58C+ (an OH-58C equipped with a roof-mounted infrared vision system to enhance target detection, recognition, and location at night). The OH-58D was considered the baseline to measure the scout candidates against.

The test primarily consisted of performing aerial reconnaissance in support of an air cavalry mission. The five scout candidates performed scout functions while teamed with either an AH-64 or AH-1 attack helicopter. The major functional areas of reconnaissance tested were

- navigation;
- detection, recognition, and location;
- survivability;
- target handover;² and
- reporting and communicating.

The comparative performance of the scout candidates in these areas, according to the Army's September 1987 test report, is shown in table 2.

²The passing (handing over) of target information from a scout helicopter to an attack helicopter.

Table 2: Aerial Scout Test Results

(1 is the best rating)

Functional category	Helicopter model				
	OH-58D	OH-58C	OH-58C+	AH-1	AH-64
Detection, recognition, and location	1	4	3	5	2
Navigation	1	3	a	4	2
Survivability	1	2	4	5	3
Target handover	2	5	4	1	3
Reporting and communicating	1	3	4	2	5

According to the Army, the OH 58C+ was not tested in the navigation category, but because it has the same navigation features as the OH 58C, its navigation performance would be equal to the OH-58C.

The Army's evaluators ranked the OH-58D best in four of the five functional categories and concluded that, overall, the OH-58D performed reconnaissance better than the other candidates. While the evaluators were able to compute rankings in the handover and the reporting and communicating categories, they found that the test information for these categories was not conclusive enough to clearly discriminate statistical differences among the five candidates. The evaluators stated that the quality of performance in these categories was driven more by team and interpersonal dynamics than by equipment differences.

According to the Army evaluators, the AH-64 was the closest to the OH-58D because of its good performance in obscured visibility conditions and its flight performance capabilities. Also, according to these evaluators, only the AH-64 and OH-58D had sufficient power margins to meet military performance standards. The OH-58C was not able to scout for the AH-64 effectively at night or in obscured conditions, and its power limitations rendered it ineffective for worldwide deployment with the AH-64. They judged the OH-58C+ to be even more underpowered than the OH-58C due to the added weight of the infrared system, which degraded its performance. They found that the AH-1 was unsuitable for the scout role because of its lack of night capability and limited flight performance capability.

The Office of the Secretary of Defense agreed with the results of the Aerial Scout Test and, in July 1988, approved procuring a total of 375 OH-58Ds for air cavalry units and artillery units. This total includes the 135 OH-58Ds already under contract.

1988 Army Plan Calls for Additional Procurement and a Potential New Mission

The Army Aviation Modernization Plan, approved in May 1988, is a long-range plan to modernize the Army's helicopter fleet through continued production of current helicopters, product improvements, new aircraft, and retirement of older helicopters. The plan includes two significant developments for the AHIP program: (1) the potential arming of the OH-58D with air-to-ground weaponry, thus giving it the capability to attack ground targets such as tanks, and (2) restoring the majority of the original OH-58D procurement.

The Army is considering arming the OH-58D with air-to-ground weapons based on recent tests which demonstrated that it can fire the Hellfire antitank missile, 2.75-inch Hydra 70 rockets, and .50 caliber machine guns. The Army had already planned to equip the OH-58D with the air-to-air Stinger missile. Army officials concluded that the available power margin in the OH-58D allowed the weight of the weapon systems and a weapons mount to be added, although flight performance would be reduced. The aviation plan provides that an armed version of the OH-58D may be fielded in the regimental and divisional cavalry squadrons to replace the AH-1 and OH-58A or OH-58C in air cavalry units as part of the plan's goals of retiring these older helicopters and reducing the fleet's size.

According to the plan, armed OH-58Ds would be used primarily in air cavalry units for armed reconnaissance, with the remainder in artillery units. Equipping OH-58Ds with this autonomous antitank capability enhances their potential use as attack helicopters. For example, the Army is considering using armed OH-58Ds to replace AH-1s and older OH-58s in the attack helicopter units of some light divisions. The modernization plan does not include using OH-58Ds with AH-64s in attack helicopter units.

The plan calls for increasing total procurement from 135 to 477 OH-58Ds, including 298 to be armed with air-to-ground weaponry such as the Hellfire antitank missile. The Office of the Secretary of Defense has approved 375 OH-58Ds through fiscal year 1994. Of these, 235 are to be equipped with air-to-ground weapons.

According to Army officials, the procurement objective of 477 OH-58Ds envisioned continuing production until the Army's Light Helicopter Experimental (LHX) deliveries began in the mid-1990s. The procurement objective was also based on affordability considerations that balanced OH-58D requirements against other aviation needs under a fixed level of funding. The plan envisions approximately \$3.4 billion in annual budget

authority to achieve modernization plan goals for all Army aircraft programs beginning with fiscal year 1989.

In May 1988, the Under Secretary of Defense, taking note of the Army's recommitment to requirements for OH-58Ds other than for artillery units, established a senior advisory group to assess several scout helicopter issues, including the extent of remaining test issues that must be resolved, and to recommend a test plan to resolve issues in the event that additional scout and armed reconnaissance aircraft are procured.

The Army May Decide to Use OH-58Ds With AH-64 Attack Helicopter Units in the Future

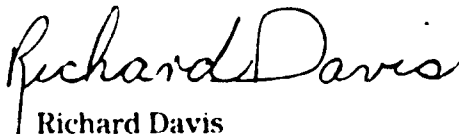
While the Army has no plan at this time to use OH-58Ds in attack helicopter units equipped with AH-64s, it may decide in the future to use OH-58Ds in this role. We were informed by Army officials that in the recent REFORGER exercises, the Army employed an AH-64 attack helicopter unit with a detachment of OH-58Ds, with highly favorable results.

If the Army were to use OH-58Ds with AH-64 attack helicopter units, it would need to demonstrate the OH-58D's operational advantage over other helicopters in performing that role. According to an official of the Office of the Secretary of Defense, the issue of the proper mix of OH-58Ds and AH-64s when working together in attack helicopter units, noted by the Secretary of Defense following the 1985 operational test, would also have to be resolved if the Army reconsiders using OH-58Ds with AH-64s in attack helicopter units. A future test of OH-58Ds working with AH-64s is planned to resolve these issues.

In conducting this review, we discussed the AHIP with officials in the U.S. Army Aviation Systems Command, St. Louis, Missouri; the U.S. Army Aviation Center, Fort Rucker, Alabama; the Office of the Deputy Chief of Staff for Operations and Plans, Washington, D.C.; and the Office of the Secretary of Defense, Washington, D.C. In addition, we examined test reports and discussed test results with officials of the Army Operational Test and Evaluation Agency. We conducted our review from January through May 1988 in accordance with generally accepted government auditing standards. We did not obtain official agency comments on this report. However, we discussed it with officials from the Office of the Secretary of Defense and the Army, and they agreed that the report accurately portrayed the status of the program.

We are sending copies of this report to the Secretaries of Defense and the Army and other interested parties.

Sincerely yours,

A handwritten signature in cursive script that reads "Richard Davis". The signature is written in dark ink and is positioned above the printed name and title.

Richard Davis
Senior Associate Director